

29th. Illinois.—Fairmont, Vermillion Co.: a tornado passed near this place in the afternoon, destroying crops, uprooting trees, etc.; its path was about two hundred yards wide.

30th. Minnesota.—Saint Paul: a severe thunder-storm, accompanied by heavy rain, occurred between 10.08 and 10.15 a. m., maximum velocity of wind fifty-six miles per hour from the west; two barges on the river were sunk, and trees and chimneys were blown down. Telephone instruments were much injured by lightning.

31st. Pennsylvania.—Houser Mill, Monroe Co.: a tornado occurred here about 9 p. m. Buildings were demolished and large trees twisted off. This storm was of remarkable violence, and is considered the most severe ever experienced.

Reports concerning the very heavy rain storms of the 9th and 10th in the upper Ohio valley were considered in the preparation of the matter published elsewhere in this REVIEW under the heading "Floods."

WATER-SPOUTS.

Pensacola, Fla.: it is reported that a water-spout was observed over the Gulf at 10.55 a. m., 11th; it moved from north-west to southeast and lasted about twenty minutes.

Saint Augustine, Fla., 18th: about 1 p. m., 17th, a large water-spout was observed in the ocean opposite North Beach. At 3 p. m. it crossed the narrow sand spot of North Beach and entered the bay with a terrible rush and ominous roar, churning up the water in a terrible whirlpool. It came directly toward the town, and was much smaller than when first observed. It crossed the town going southwest, and crushed in several buildings; its passage being followed by torrents of rain.—*The (Oswego, N. Y.) Palladium.*

On the evening of the 17th a water-spout burst near Purcell Station on the banks of the river Duckee, Ind., covering the railroad tracks and surrounding country with two feet of water. A passenger train was derailed.

INLAND NAVIGATION.

STAGE OF WATER IN RIVERS AND HARBORS.

Arkansas River.—Dodge City, Kans., 14th: the water in the river at this place is from one to two feet wide and some inches deep, being the lowest stage of water observed here for many years; the river is entirely dry a few miles below this city.

Cumberland River.—Nashville, Tenn., 28th: the navigation of the season is at a stand still on account of low water; the past season has been an unusually short one; a great deal of freight is waiting transportation on the upper Cumberland, which cannot be brought down until after the autumn rise.

Tennessee River.—Chattanooga, Tenn.: on account of low water navigation was closed to all vessels on the 28th.

In the following table are shown the danger-points at the various stations, the highest and lowest depths for July, 1888, with the dates of occurrence and the monthly ranges:

Heights of rivers above low-water mark, July, 1888 (in feet and tenths).

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
Red River:						
Shreveport, La.	29.9	8 to 11	20.2	31	14.4	6.8
Arkansas River:						
Fort Smith, Ark.	22.0	1	9.0	24	2.5	6.5
Little Rock, Ark.	23.0	1	13.1	26, 27	4.3	8.8
Missouri River:						
Kansas City, Mo.	24.0	2, 3	20.4	31	12.1	8.3
Omaha, Nebr.	18.0	1	16.1	31	9.9	6.2
Leavenworth, Kans.	20.0	3	18.2	31	11.7	6.5
Mississippi River:						
Saint Paul, Minn.	14.5	1	7.8	30	4.7	3.1
La Crosse, Wis.	24.0	1	9.9	31	5.9	4.0
Dubuque, Iowa	16.0	1	12.1	31	6.4	5.7
Davenport, Iowa	15.0	1	9.5	31	4.5	5.0
Keokuk, Iowa	14.0	9, 10	10.1	31	5.1	5.0
Saint Louis, Mo.	32.0	1	27.1	31	16.4	10.7
Calo, Ill.	40.0	19, 20	28.7	31	17.3	11.4
Memphis, Tenn.	34.0	22	23.6	31	15.2	8.4
Vicksburg, Miss.	41.0	10, 11	30.0	31	25.5	4.5
New Orleans, La.	13.0	1 to 3	10.4	31	8.1	2.3
Ohio River:						
Pittsburg, Pa.	22.0	11	22.0	28	1.6	20.4
Cincinnati, Ohio	50.0	15	31.5	4	7.4	24.1
Louisville, Ky.	25.0	16	11.3	1, 5, 6	4.6	6.7
Cumberland River:						
Nashville, Tenn.	40.0	1	13.3	31	2.1	11.2
Tennessee River:						
Chattanooga, Tenn.	33.0	1	7.1	29	1.8	5.3
Savannah River:						
Augusta, Ga.	32.0	31	9.3	16	6.3	3.5
Willamette River:						
Portland, Oregon.	1	14.6	31	7.0	7.6

FLOODS.

A destructive flood, resulting from the heavy rains of the 8th, 9th, and 10th, occurred along the valley of the Monongahela River, and the rivers of western Pennsylvania and West Virginia were swollen into torrents. At Grafton the rise was unprecedented, and the lumber interests suffered severely, the loss to the town and section being estimated at \$250,000. The damage at Rowlesburg was also heavy. Advices from Wheeling, W. Va., state that the freshet was the greatest ever known in that section, and that the destruction to property was beyond computation. The Signal Service observer at Pittsburg reports "that owing to the heavy rains in the Monongahela Valley the Monongahela River rose at the rate of nine inches per hour throughout the day of the 10th, carrying destruction along its shores from the headwaters to the mouth of the river. At points above Pittsburg the river was higher than ever before, reaching forty-three feet at Greensborough, Penn., on the 11th. The damage done by the overflow at Pittsburg during the 10th and 11th is estimated at \$300,000. The river began to fall on the 12th." At Parkersburg, W. Va., the Kanawha River rose thirteen feet on the 10th, washing away one bridge. The following total rainfalls, in inches, from the 8th to the 10th, inclusive, have been reported from stations in Pennsylvania: Pittsburg, 1.60; Uniontown, 2.43; Indiana, 3.56; Somerset, 2.00; Charlesville, 1.56; Huntingdon, 1.62. From the 7th to the 10th the precipitation at Parkersburg, W. Va., amounted to 7.32 inches, and at Columbus, Ohio, 3.24 inches fell during the 8th and 9th. The heavy rains of the 9th and 10th were also very destructive in central and southern Illinois, and in portions of eastern Indiana, causing great damage to crops. A terrific rain storm or cloud-burst occurred at Wheeling, W. Va., on the evening of the 19th. Many lives were lost; houses were wrecked; bridges carried away, and great damage done to property. Reports from all parts of Ohio county, W. Va., indicate that the storm was very disastrous to life and property. At Triadelphia it was particularly severe. Over a considerable part of Belmont county, Ohio, the damage to fruit and crops was very great.

During the afternoon of the 1st a heavy rain storm of short duration visited Deadwood, Dak., and vicinity, causing floods in the gulches and valleys, and doing considerable damage to property, live stock, and crops.

HIGH TIDE.

Galveston, Tex., 5th.

ATMOSPHERIC ELECTRICITY.

THUNDER-STORMS.

From the accompanying table it will be seen that thunder-storms were reported from the largest number (thirty-four) of

states and territories on the 5th, and nearly as many (32) occurred on the 27th and 30th, respectively. They were least extensively reported on the 15th, on which date they occurred